Epidemiologic studies of styrene and cancer:

A review of the literature*

P Boffetta[1], H-O Adami[2], P Cole[3], D Trichopoulos[2], J Mandel[4]

[1] International Agency for Research on Cancer. Vanderbilt University.

[2] School of Public Health, Harvard University.

[3] School of Public Health, University of Alabama at Birmingham.

[4] School of Public Health, University of Toronto.

2/24/09

2: OVERALL FINDINGS

	LHP (x NHL + Leuk)		Non-Hodgkin		Leukemias	
	Obs.	Exp.	Obs.	Exp.	Obs.	Exp.
Prod. & Poly.	12	6.1	10	6.6	9	7.7
S-B R Plastics	71	81.3	61	56.6	86	84.5
S B Rubber	38	38.2	53	53.0	71	61.2
Total	121	125.6	124	116.2	166*	153.6*
SMR	0.97	(0.81-1.16)	1.07	(0.90-1.27)	1.08	(0.93-1.26)
Studies	6		6		7	

* Corrected from values in Table 3 of Comments. SMR unchanged.

POSITIVE FINDINGS

Brief Citation	Non-Hodgkin Lymphoma			Leukemia		
	Obs.	Exp.	SMR	Obs.	Exp.	SMR
Hodgson, 1985	3	0.6	5.36	-	-	-
Bond, 1992	7	6.0	1.17	9	7.6	1.18
Kolstad, 1994	42	31.5	1.33	42	34.4	1.22
Delzell, 2006	-	-	-	71	61.2	1.16
Total	52	38.1	1.36	122	103.2	1.18

4:

SUMMARY OF INTERNAL ANALYSES

Study/Metric	NHL	Leukemia
duration exposed		
time since hire		
Kogevinas 1994		
avg. exposure		
cumulative exp.	No	No
	Yes	No
	Yes	No
duration exposed	No	No
early v. recent		
Kolstad 1994		
	No	Yes
duration exposed	No	Inverse
early v. recent		
Delzell 2006		
cumulative exp.	No	Yes
peaks	-	Yes	No
	Weak	→No
	No	Weak

2/24/09

5: LIKELIHOOD OF CAUSATION

Known

Sufficient

"Known" (>95%)

Suspect

Probable **Reasonably**

" Probable"(>50%) **anticipated**

Credible

Plausible

Possible

"Possible" (>0%)

2/24/09
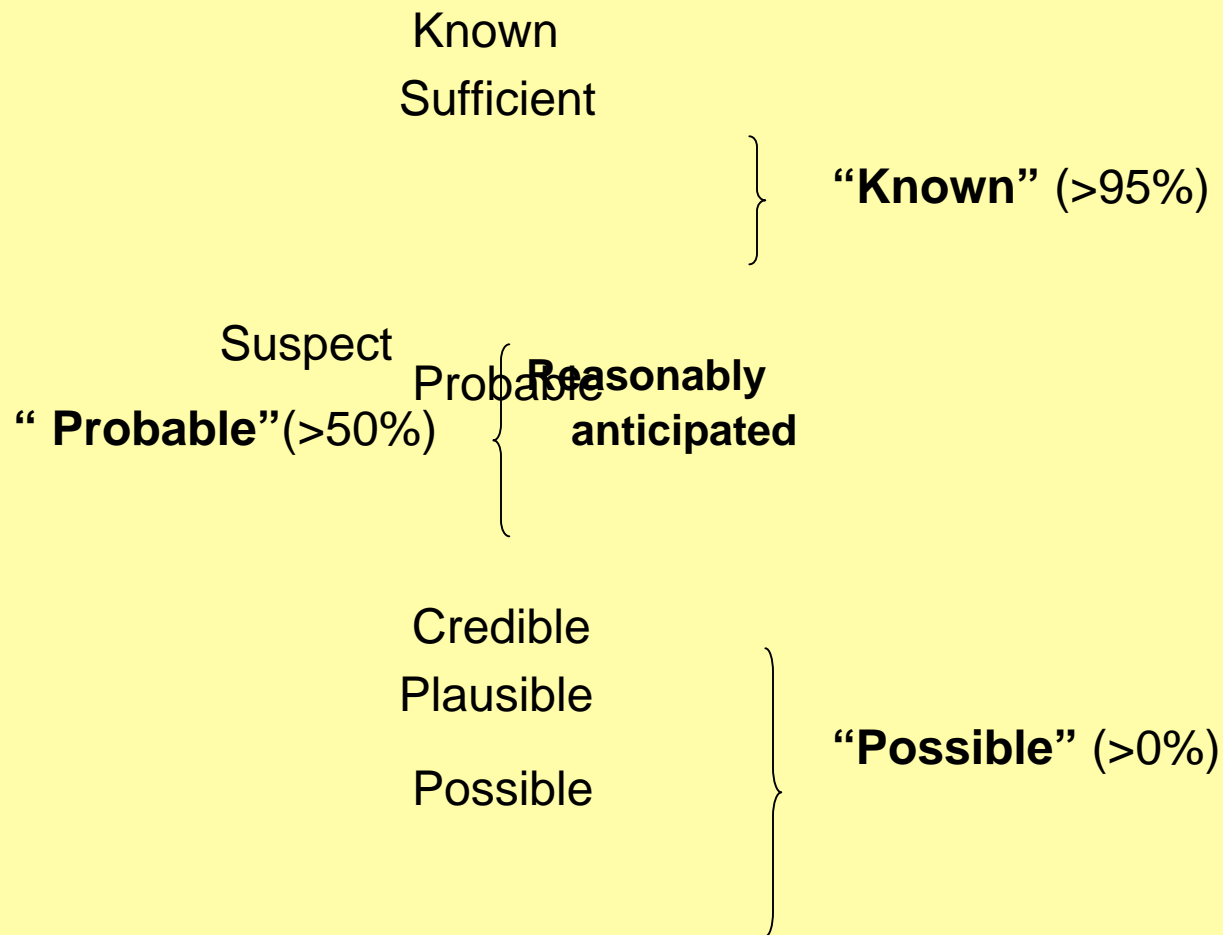
6: IARC and NTP: KNOWN / TOTAL

	IARC			NTP		
	Group	No.	Percent	Group	No.	Percent
2 1		105	25%	A	54	23%
Total	a+b	314	75%	B	183	77%
		419	100%		237	100%

NTP GROUP B AGENTS – AS CLASSIFIED BY IARC

IARC				NTP *(according to IARC Group)*		
Group	66 No.	Percent		Group	No.	Percent
2a	248	21%	B	prob.	41	27%
Total b		79%		poss.	112	73%
	314	100%			153*	100%

2

NTP:

IARC:

Probable/(Probable + Possible) = 41/153 = 27%

Probable/(Probable + Possible) = 66/314 = 21%

*

Excludes 30 entries found in IARC Groups 1 and 3, duplicates and unresolved.

2/24/09